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IN THIS ISSUE

Survey Shows Growth in

Educational Facilities

Part III of a three-part series on

Pulmonary Emphysema

The second of two articles on

Therapeutic Aerosols

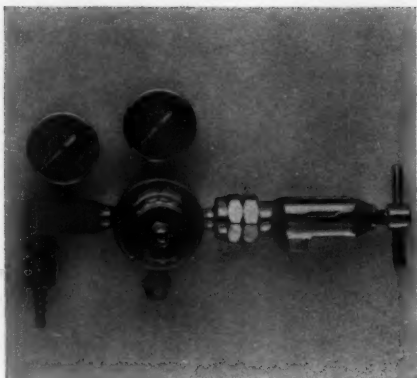
Volume 5 Number 3

June 1960

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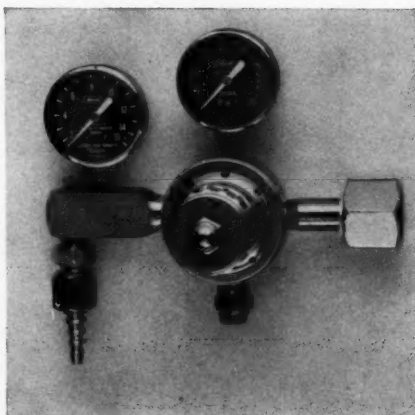
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inhalation therapy

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ARTICLES

Editorial: P. A. and You *Madison B. Brown, M.D.* 10

Pulmonary Emphysema: Part III—Therapeutic Attack Has Many Facets 12
Seymour M. Farber, M.D., and Roger H. L. Wilson, M.D.

Therapeutic Aerosols: Part II—How to Use Them Effectively 18
Joseph B. Miller, M.D.

Survey Shows Growth in Educational Facilities 20
James F. Whitacre

REGULAR FEATURES

Chapter Activities 24 From Your Executive Director 26
Book Reviews 28

JOURNAL OF THE AMERICAN ASSOCIATION OF INHALATION THERAPISTS

EDITORIAL OFFICE
260 Crittenden Boulevard
Rochester 20, New York

BUSINESS OFFICE
332 South Michigan Avenue
Chicago 4, Illinois

Editor
JAMES F. WHITACRE

Publisher
ALBERT CARRIERE

ADVERTISING REPRESENTATIVE
Samuel N. Turiel & Associates, Inc.
430 North Michigan Avenue
Chicago 11, Illinois

Staff Artist
ROSEMARY F. YOUNG

Production Manager
FRANK HUSTON

Established 1956 and published bi-monthly in February, April, June, August, October, and December at 332 South Michigan Avenue, Chicago 4, Illinois. Single copies \$1; subscriptions \$5 per year to non-members in the United States and Canada, \$6 elsewhere; \$3 to members (included in dues). Copyright © 1960 by the American Association of Inhalation Therapists. All rights reserved. Reproduction in whole or in part without the express, written permission of the Publisher is prohibited.

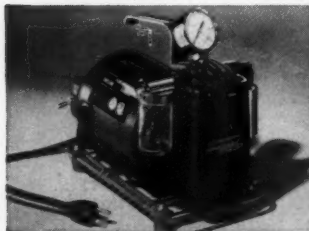
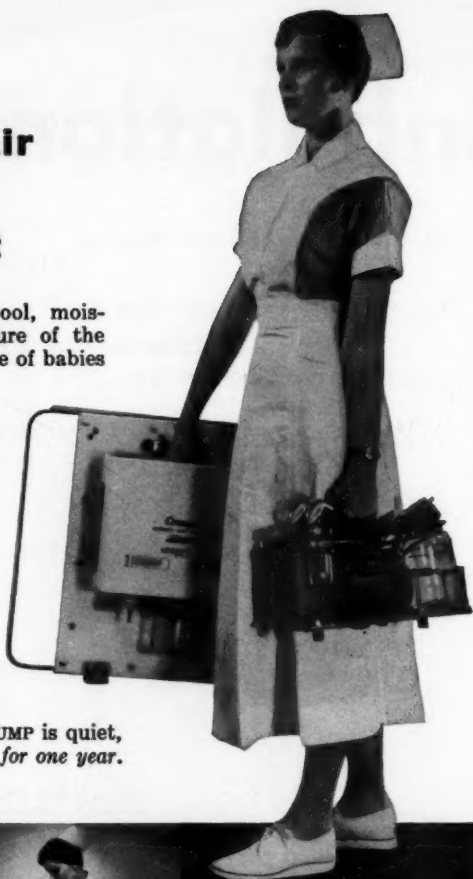
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1. Kirkwood, E. S.: Nursing World 129:8, 1955.



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The child was placed in a croup tent with a humidifier, and antibiotics were administered. The condition did not change and Alevaire aerosol was begun in the evening. The cough gradually became easier and less frequent. The next day he rested comfortably, his temperature was reduced, no respiratory distress was noted, and the lungs were almost clear on auscultation. A day later no further therapy was required and the child was discharged on the fourth day after admission.

*Smessaert, Andre; Collins, V.J.; and Kracum, V.D.:
New York Jour. Med., 55:1587, June 1, 1955.

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- routine oxygen therapy • tracheotomy
- prevention of postoperative pulmonary complications



Editorial

P. A. and You

AS MEMBERS OF the health team, inhalation therapists play an important role in patient care. Other members of the team with whom your special knowledge and abilities must be shared to provide today's complex and comprehensive care are physicians, surgeons, anesthesiologists and nurses, all of whom rely on your capabilities. These responsibilities and interdependence cannot be taken lightly.

The therapist may fully satisfy professional requirements regarding knowledge and competency, but fall far short of the proper attitude, and thus not be able to contribute successfully as a member of the health team.

The dictionary defines *attitude* as, "a position assumed or studied to serve a purpose." Professional attitude is in large part established by our conduct, dress and manner of dealing with others. In other words, in assuming the true professional attitude, you must dress well, speak well, and so *look* the part. You may assume that your particular sphere of knowledge and capability will command the respect of the doctors, nurses and patients with whom you work.

But your acceptance as a professional person is achieved in a larger degree by your attitude. Confidence in your own abilities should be conscientiously controlled in dealing with others. Not only must you know the sphere of knowledge and responsibility of the others with whom you work, but they in turn must know and give deference to yours. It is this summation of professional disciplines contributing to patient care that makes effective team work.

Mutuality of respect for each member of the health team, coupled with an effective organization creates the environment for effective professional attitude. Individuality is common in the health professions, and it is understood that individuality in the exercise of particular knowledge is anticipated in the practice of medicine. Unfortunately, at times too much individuality makes for poor team work. Humility is an attribute which can contribute very constructively here. The very fact that our total knowledge in the fields of medicine is very extensive has made it necessary for specialization. Inhalation therapy is part of this total complexity, and contributes in a substantial way to patient care.

In discussing attitude in the professional sense, President Millis of Western Reserve University recently stated that channels of communication are most important for effective understanding. The attitude in which meetings are conducted, he said, creates success or failure. Communication to be effective must be conducted not just vertically from higher to lower echelons, but horizontally at each level as well.

Organization and satisfactory structuring for effective communication are most important in the maintenance of high level professional attitudes. The concept of team nursing with conferences for each shift is an example of how to create the atmosphere for development of such an attitude.

Too often it is the little things we do not consider important that defeat the sum total of good patient care. For each of us working in hospitals there is the continuous need to do better—to improve ourselves, to do our best and to contribute to the team nothing but our best. As the new developments occur in all the fields of medicine and surgery, your responsibilities will increase. Patient care will become more exacting in the years ahead, and each discipline in the health care team must be ready to move forward and bring these advantages to the patient.

Are you ready? Have you kept abreast of the science and knowledge in the sphere of our responsibility? Are you resenting a younger and newer technician on the staff because *you* did not keep up? Are you tired of suggesting improvements for service by your department because someone won't listen? Has your job lost its glamour? Has the thrill of success in saving a patient's life been lost because it seems commonplace? Then you have lost your professional attitude!

I sincerely hope this is not so, because patient care is *not* incidental, whether we draw the knife, order the cardiogram, provide the food, test the oxygen flow meters, sweep the floor or do anything else. Each of us provides his knowledge and effort to help return a patient to well-being.

Professional attitude is so many things: our knowledge, our honesty, our appearance, our sense of fair play, our team work, our voluntary and whole-hearted support of patient care. It is that important difference which sets apart the true professional from the routine employee who is just doing a job, un-imaginatively and without curiosity or initiative.

—Madison B. Brown, M.D.

Associate Director
American Hospital Association

AMERICAN ASSOCIATION OF INHALATION THERAPISTS

THE AMERICAN ASSOCIATION OF INHALATION THERAPISTS is an organization of therapy technicians working: In hospitals, for firms providing emergency therapy service, and for municipal organizations. The Association is sponsored jointly by the American College of Chest Physicians and the American Society of Anesthesiologists. Three doctors from each group comprise the joint Board of Advisors to the AAIT, which has nearly 900 members in the United States, Canada, and several countries abroad.



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The length of this monograph requires that we divide the condensation into three parts. This final part deals with the treatment of the disease. Part I, published in February, described the ailment. Part II, in April, discussed testing, and CO₂ narcosis and respiratory acidosis. (Condensed from CIBA CLINICAL SYMPOSIA, Volume 10, Number 6, and reprinted with permission of that publication and the authors, Drs. Farber and Wilson.)

Pulmonary Emphysema: Part III

Therapeutic attack has many facets, each demanding careful attention

by Seymour M. Farber, M.D. and Roger H. L. Wilson, M.D.

THE FIRST THING that must be done about the patient with emphysema is to explain carefully to him the nature of his illness. The changes in his lungs are irreparable. They will tend to get worse. Thus the more he learns about his disability and the measures that must be used for his relief, the more cooperative he will be in carrying out prolonged therapy.

Our patients receive written instruc-

tions. The introduction summarizes the foregoing remarks quite frankly and gives a simplified physiological explanation of what is wrong and just what things can be done to help.

From this we go on to a section on breathing exercises which we divide into those for the diaphragm and the chest muscles, and then a section on special devices and medication, and finally general instructions. The patients take this home and read it over and over, and their families read it over and over. It is one of the most useful things we can give them.

With this approach the patient quickly gets the idea that the therapeutic attack is not merely a matter of taking pills; rather it has many facets, each of which must have careful attention.

Breathing Exercises. As we have pointed out earlier, the lungs are not involved uniformly. Some portions ventilate far better than others. The purpose of our breathing exercises, therefore, are threefold:

1. They help the patient to get maximum ventilation from all parts of his lungs and therefore to breathe more efficiently.



Dr. Farber, left, is assistant dean, University of California Medical Center (Continuing Education), chief of the University of California tuberculosis and chest service at San Francisco General Hospital, and president of the American College of Chest Physicians. **Dr. Wilson** is assistant clinical professor of medicine, University of California School of Medicine in San Francisco, and is in charge of the pulmonary physiology laboratory on the University of California Service, Ward 62, San Francisco General Hospital, San Francisco, California.

2. They strengthen the muscles of respiration.

3. They reinforce the patient's realization of his disability and his determination to prevent progression.

Pursed-Lip Breathing. As explained earlier, the chief difficulty in emphysema is the tendency of the bronchi to collapse during expiration due to (a) their loss of elasticity, and (b) the positive intrathoracic pressure that is necessary to force air from inelastic lungs.

If the lips are pursed during expiration, the pressure within the bronchi is increased because the air must be forced through the narrow opening between the lips. This encourages the bronchi to remain open during expiration, thus improving this most difficult phase of respiration for the emphysematous patient.

Bronchodilators. Since one of the main defects in emphysema is the bronchial narrowing, particularly during expiration, therapy aimed directly at increasing the bronchial caliber must have highest priority.

One of the most effective ways to utilize the dilating effect of epinephrine-like drugs is direct application to the bronchi by use of a hand nebulizer as shown in Plate I.

To be effective it is essential that the kind of nebulizer used should produce droplets of a very small size, preferably averaging three microns or below. Otherwise the spray will not pass much beyond the larynx, trachea, and very large bronchi which are not particularly involved. Even in the presence of systemic hyper-tension, epinephrine-like drugs are safe to use frequently and in large doses by the nebulized route since systemic absorption is limited. Some useful preparations for this method are: racemic epinephrine (Vaponefrin), isopropyl norepinephrine (Isuprel), N-substituted arterenol derivative (Caytine), and isoproterenol with Phenylephrine (Nebu-Prel).

It is important that the patient be care-

fully instructed on the proper use of his nebulizer. Our own instructions are:

"Your hand nebulizer is to become your most constant companion. It should be by your bed when you go to sleep at night and on your person whenever you leave the house. By now you probably know very well when an attack of difficult breathing is about to begin. For most patients a feeling of tightness in the chest is the first sign of trouble. This tightness represents a reduction in the diameter of your air passages. The fluid in your nebulizer is a dilator; it enlarges these passages. Therefore, if you will use it at the first feeling of tightness, you will generally be able to avoid altogether attacks of difficult breathing. In any case such attacks will be less severe. You should also get into the habit of foreseeing the kind of activity which may bring on an attack of difficult breathing.

"You should use your nebulizer before you undertake such activities since it is much easier to prevent trouble than to stop it after it is under way. However, do not use the nebulizer more often than you have been told since, if it is used too often, it may gradually lose its effect. In any case do not use it carelessly.

"Open your mouth widely and put the nozzle of the nebulizer well into the back of the mouth. Then pump the hand bulb vigorously while you breathe in through the mouth six times. Give a cough and raise any sputum that has accumulated; then repeat the treatment. Remember, take your time and give yourself a full treatment every time you use the nebulizer; do not get into the habit of 'taking a whiff or so now and then.'"

After a time it is often found advisable to switch to another nebulizing agent and then back to the original one. It must be

continued on page 15

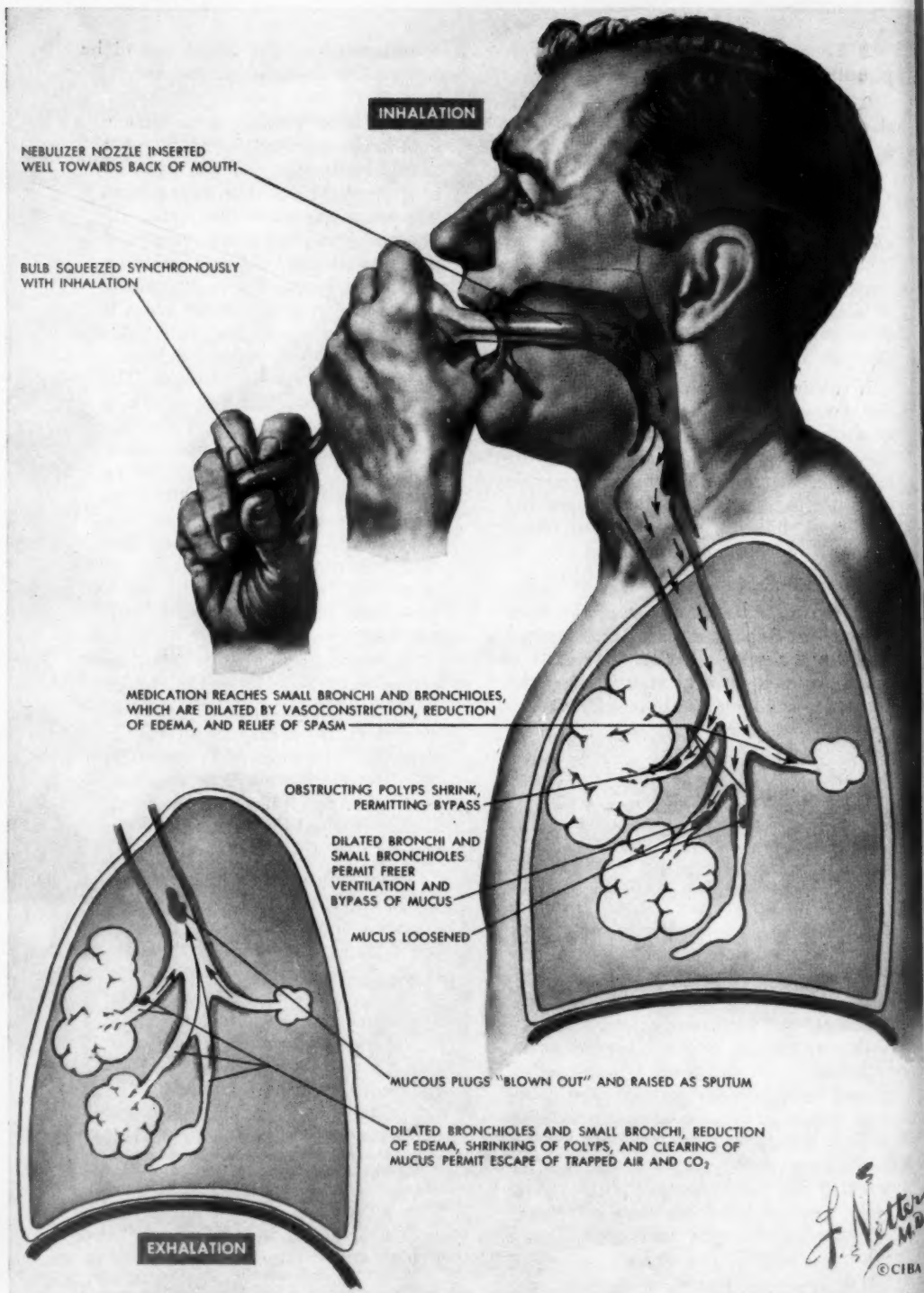


PLATE I—USE OF THE HAND NEBULIZER

continued from page 13

remembered that *the effects of the bronchodilator are not so much to reduce bronchial muscle spasm as to act as a vasoconstricting agent, reducing edema, widening the air passages, and permitting the expectoration of mucous plugs.*

One of the most important times to use the nebulizer is on arising in the morning since during the night mucus accumulates due to the shallower breathing and diminished cough reflex.

Intermittent Positive Pressure Breathing (IPPB). The intermittent positive pressure valve is one of the most significant advances in recent years in the treatment of chronic bronchitis. Designed to supply a controlled pressure during inspiration, to cycle at the patient's will, and to apply aerosolized medication, it is a major triumph of medical engineering (Plate II).

For IPPB to be effective, the patient must permit his lungs to expand fully. The design of the equipment is such that when pressure becomes equalized the valve will turn off, but many patients tend to blow, which cuts off inspiration at or before the peak of vital capacity. If the patient will cooperate, large volumes can be inspired. A value of as much as 675 ml. above the inspiratory reserve was recorded in one of our patients. This appears to result from depressing the diaphragm farther than normal and also from preventing whatever paradoxical elevation occurs in some patients at full inspiration.

If used properly, patients will cough up mucus with this therapy; otherwise an important advantage of the hyperventilation produced by this technique will be missed.

With regard to the use of bronchodilator drugs with IPPB, it is our experience that a much smaller dose of nebulized bronchodilator appears to be necessary when IPPB is administered simultaneously. For this purpose a small aerosol gun containing the bronchodilator is inserted in the IPPB circuit. This may deliver the bronchodilator continuously or only during inspiration, depending on the type of equipment.

If viscid sputum is a factor, intermittent positive pressure appears to afford more relief than a bronchodilator drug alone. In patients with inefficient cough and uneven ventilation, there is considerable benefit in the long-term application of intermittent positive pressure breathing as a mechanism for clearing away secretions. Many patients find IPPB of the greatest use in the morning on arising, to aid in expectoration of mucus. The relief they obtain from this therapy is commonly greater than they had obtained from any bronchodilator drug used alone.

Use of IPPB should be regulated according to the amount of improvement shown and the severity of the disease. In early cases it is sufficient to apply it at the office or clinic only when the patient has a cold. In more advanced cases a patient may wish to have an apparatus in his home and to use it particularly on arising in the morning and at night before retiring. In some cases active work can be carried on only by having such an apparatus mobile and freely available at his work, in the car, and at home.

We prefer patients to use 40% oxygen, but IPPB may be run on either 100% oxygen or on compressed air. Our reasons for preferring the 40% oxygen are: this concentration represents a reasonable economy in oxygen with the advantages of adequately oxygenating the patient from time to time during the day, while avoiding any cardiovascular complications from increasing the amounts of bronchodilator drugs.

Where patients have developed respiratory acidosis it becomes very much more important that they should use IPPB in full treatments several times during the day to blow off accumulating carbon dioxide. It is also important that when patients are prescribed such apparatus, they should realize that benefit is obtained by the combined therapy of oxygen, careful hyperventilation, and medication of the bronchi. In carbon dioxide narcosis the apparatus may have to be fitted to the opening of a tracheotomy tube which

continued on page 17

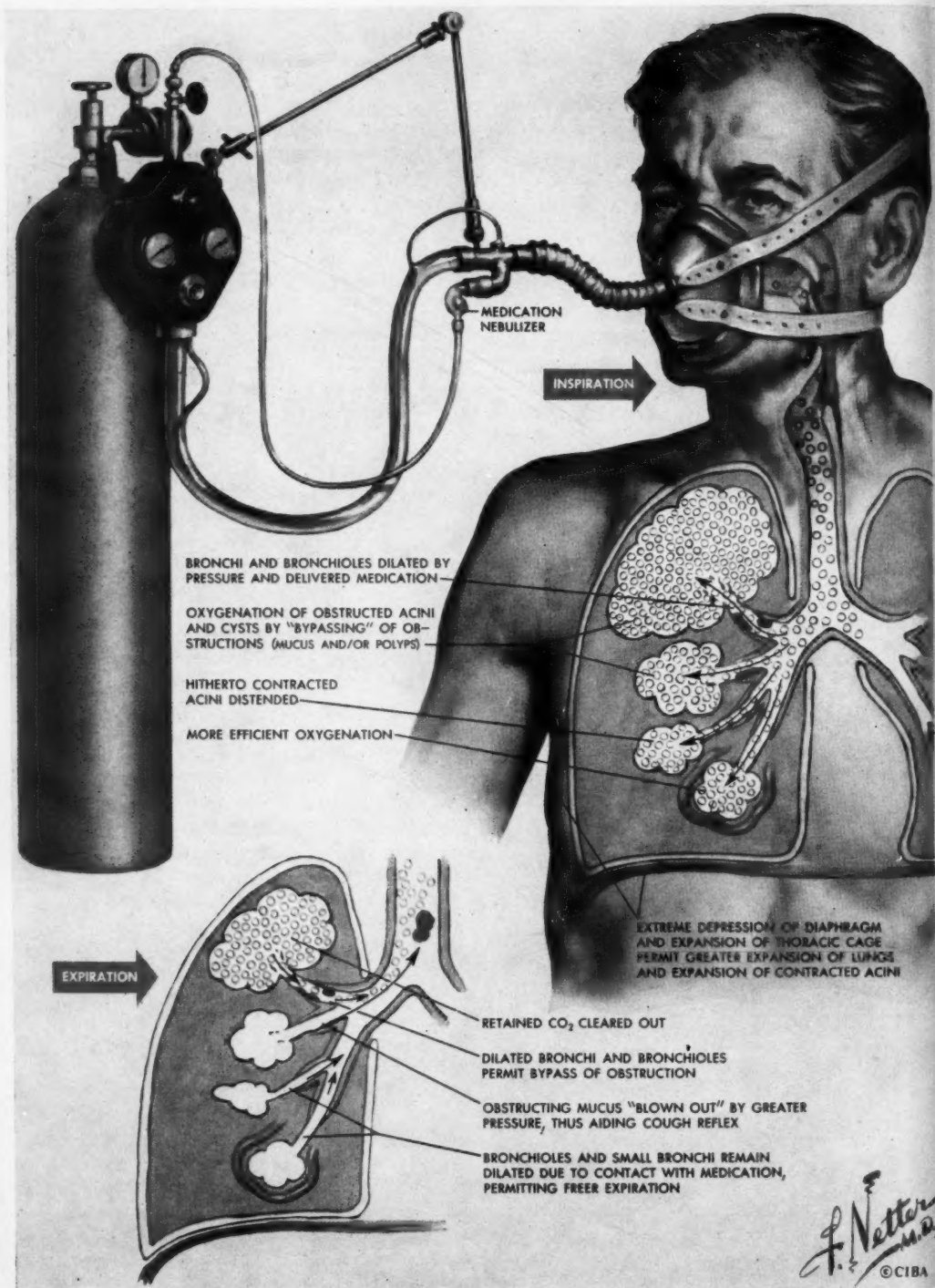


PLATE II—INTERMITTENT POSITIVE PRESSURE BREATHING

continued from page 15

has to be inserted to control bronchial secretion and improve ventilation.

Selection of Patients for IPPB: It is important to establish whether or not intermittent positive pressure breathing should or should not be used in any particular patient. This is best done by obtaining a spirogram, treating the patient for 10 to 15 minutes with IPPB, and immediately repeating the spirogram. A few patients with check valve cystic disease as a major component will respond unfavorably to this form of treatment. Some patients show little obvious improvement.

However, the majority of patients after such treatment for 10 to 20 minutes will show a marked improvement of their timed expiratory capacity and a marked improvement of their exercise tolerance which may last some hours. If any improvement is shown, then it is obvious that this is a beneficial form of therapy. If no improvement is shown, it must be kept in mind that at a subsequent time, when perhaps a respiratory infection is present, it may do a great deal of good. It should be retried when such a situation exists.

Sputum Liquefying Agents. Oral sputum liquefactors, such as the iodides, are somewhat disappointing in chronic obstructive emphysema.

By far the most useful liquefying agent is water, both by mouth and by inhalation, the latter in the form of hot steam or cold nebulized water. However, to be satisfactory the output of a water nebulizer must be more than 20 ml. of water per hour. To the water may be added wetting agents, of which there are several on the market, and exosmotics-cum-wetting agents, such as glycerol or propylene glycol. It is our impression that it is the water itself that is the most useful part of this therapy, although much research remains to be done in this area.

The routine use of enzymes, such as trypsin or desoxyribonuclease, in these patients appears to have some risk. We have frequently observed hypersensitivity to these enzymes. In the case of trypsin there is a definite change produced on the bronchial mucosa, which is thought

to be undesirable. We reserve these agents for emergency use in exacerbations. One must remember that bronchial mucosa, when it is at its healthiest, is a very delicate mucous membrane; when it is suffering the assaults of a disease process, great care must be taken not to insult it any further.

Treatment of the Acute Episode of Carbon Dioxide Narcosis. In the presence of suspected carbon dioxide narcosis, it is necessary to be most energetic in one's therapy. Any delay may give rise to deepening of the narcosis with the increased risk of a fatal outcome.

The most important thing for the patient is the elimination of CO₂ by improving ventilation. To accomplish this it may be necessary to do a tracheotomy and to institute intermittent positive pressure breathing around the clock. Coughing will not only be inadequate but may be absent. Therefore, to assist in the evacuation of secretions, mechanical aids, such as suction and a cough machine (OEM Coflator), will be required from time to time.

Energetic antibiotic therapy, as well as therapy for cor pulmonale (which is almost certain to be present at some time, must be instituted. Adequate hydration is all-important.

The use of oxygen in emphysema has been a matter of much discussion in recent years. Provided that ventilation and thus CO₂ excretion is maintained, there is little doubt that improving the patient's oxygenation is of real value. Moreover, shortage of oxygen in the medulla increases the narcotic effect of CO₂ in excessive amounts. Therefore, the use of oxygen at a flow sufficient to give a concentration between 30 and 40% is often beneficial. *It must be carefully supervised and adequately humidified.*

In the presence of CO₂ narcosis, particular care in the use of oxygen is needed because this may remove the only remaining stimulus to respiration. However, it may be possible to supply a very slow flow with careful watch of the patient by the physician. The main drive must be to the establishment of as much alveo-

continued on page 27

How to use aerosols effectively

by Joseph B. Miller, M.D.

Concluding a two-part series, Dr. Miller here discusses how therapeutic aerosols are applied. Part I of the series was published in the April issue.

THERE ARE A number of widely accepted uses of aerosols (see Table 1). And, of course, there are many other possibilities which have been tried with varying degrees of success—such bizarre ones, for instance, as vitamin B₁₂ for pernicious anemia and posterior pituitary hormone for enuresis. But these are not very practical.

It is sometimes suggested that the extensive pulmonary circulation affords a good site for applying systemic medications via aerosols for quick uptake and action without resorting to intravenous administration. This is true in the "normal healthy individual," and with drugs which are not irritating to the pulmonary mucosa; but it must be borne in mind that in treating a *diseased* patient, the ventilation : perfusion ratio may not be normal, the pulmonary capillary bed may be damaged or have numerous shunts, and other abnormalities may all work to make

the drug uptake anything but what is expected on the basis of responses in normal young medical students—the usual subjects used in determining such standards in the literature.

We are therefore considering in inhalation therapy chiefly aerosols given for therapeutic effects to be accomplished in the lungs. Even here, there is sometimes much more marked response in one case than another, and these differences may be attributed to presence of thick secretions which medications must penetrate before reaching actual lung tissue, or to other abnormalities which interfere with getting the medication to the target site. Indeed, some of the agents we use—detergents and enzymes, notably—are intended to help clear the way for other medications to follow when the target can be reached.

Having in our previous article considered the nature of aerosols, we are ready now to discuss some of the ways and means of applying them.

Hand Bulb Nebulizers, like the DeVilbiss 40 and the Vaponephrin, are used for small doses of epinephrine and isoproterenol and things of that sort, and have been for a long time. However, as far as the hand bulb is concerned, this is the only application for which they are satisfactory. Just a look at Table II shows what an inefficient means of producing aerosols this is. Using it even under the optimum conditions, a patient would have to squeeze the bulb 350 times in order to nebulize only 1 cc of solution! Now a patient gets tired after squeezing about

Dr. Miller specializes in pediatrics and pediatric allergies. He is a research associate at Spring Hill College, Mobile, Alabama; a Fellow, American Academy of Pediatrics; a Diplomate, American Board of Pediatrics; an Associate Fellow, American College of Allergists; a member, American Academy of Allergy.



20 times. Of course, he can change hands, but even that way gets pretty tiresome after a couple of hundred times.

TABLE I

Range of Uses of Aerosols

PURPOSE	AEROSOL TYPE
Combat Infection	Antibiotic
Eliminate Secretions	Mucolytic agents
Relieve Mucosal Edema	Vasoconstrictors
Relieve Bronchospasm	Bronchodilators
Disperse Foam	Antifoaming agents
Hydrate the mucosa	Water, saline
Topical Anesthesia	Pontocaine

TABLE II

Number of squeezes to nebulize 1 cc of fluid DeVilbiss or Vaponephrin hand bulb nebulizer

Vent open, no attachments	350
Same, with nose pieces	488
Vent closed, no attachments	989
Same, with nose pieces	1,516
For a 10 cc treatment	15,000

How much are we giving our patients in the average bronchodilator treatment, which is 5 or 10 squeezes? If 350 are required for 1 cc, then 10 squeezes represents 10/350 cc, or 1/35 cc. A 1% solution contains 1 gram per 100 cc, or 0.01 gram (which is 10 mg) in 1 cc. One 35th of that—which is all we're giving in 10 squeezes—would be 0.268 mg (say 0.3 mg for ease of calculation). By PSP deposition studies, it has been found that only about 15% of the inhaled aerosol is retained. Most of it evaporates before it ever reaches the target site for deposition, and some of it is exhaled undeposited, of course. Therefore, we arrive at a *retained* dose of 15% of 0.3 mg, or only 0.045 mg!

This certainly attests to the potency of these pharmacologically active drugs, and to the inadequacy of the hand bulb nebulizer for *physically* acting agents like Alevoire, where *quantity* of agent is required for results.

Intermittent Therapy. To be effective, I say this must be for at least an hour. Some say 30 minutes, some recommend as short as 20 minutes; but with a 20- or 30-minute treatment, even if the aerosol

were stabilized with glycerine, not even the upper half of the respiratory mucosa would be covered. This has been found out by inhaling aerosols of 1% or even 0.01% epinephrine stabilized with glycerine and containing a detergent, and then observing the bronchial mucosa with the bronchoscope. Epinephrine's local vasoconstrictor effect on the mucosal blood vessels causes the mucosa to look whitened wherever the drug contacts it.

So if you bronchoscope the patient after he has inhaled this aerosol, you can see just how far down the whitened area extends. Repeated observations in a number of subjects have established that the blanching from a 30-minute treatment will reach down into the trachea and larger bronchi, and the beginning of the segmental bronchi. And then you can see the blanching end and the normal pink mucosa resume. Hence, 30 minutes of inhalation of aerosol does not affect the bronchioles significantly, and doesn't even come close to the alveoli.

This is to a large extent because of baffling. The greatest amount occurs at the first turn in the airway—the pharynx; the next greatest amount in the larynx, as it goes through the narrowed vocal cord opening; the next at the carina, etc. So in order to get really *low* deposition, it is necessary to give *long* treatments—a minimum of an hour. From these considerations it is evident that four treatments a day of 30 minutes each will not begin to do as much for the recesses of the lung as only two treatments of an hour apiece will do.

Treatment has to be individualized, because no two patients want the same sort. One will refuse a mask, another will accept a mask and refuse a tent; one will refuse a catheter, and another will have nothing *but* a catheter, and so on. Catheters certainly shouldn't be used for this purpose if anything else will do, because they choke the mist down so much. The most efficient means entail the least obstruction possible. It is best for the tubing which runs from nebulizer to patient to be the same diameter as the output port of the nebulizer. If it's smaller, there is

continued on page 29

Survey Shows Growth In Educational Facilities

by James F. Whitacre

FOR SEVERAL years now we have been talking about formal education for inhalation therapy technicians. With the advent of the American Registry of Inhalation Therapists, there is a more intensified effort to get such programs under way, to give workers aspiring to registration a means of meeting official requirements and preparing for examinations given by the registry board.

As long ago as 1955, the New York State Academy of Medicine and the New York State Society of Anesthesiologists jointly proposed to the American Medical Association's Council on Education and Hospitals a set of "Essentials of an Acceptable School for Inhalation Therapy Technicians." These criteria were published in the April 15, 1956 issue of the *New York State Journal of Medicine*, and again in the August 1956 issue of *INHALATION THERAPY*. The AMA recommended that schools use these as a guide in setting up their programs.

For a long time many people felt they were unrealistic, and too difficult of attainment. In addition, there was not a very large demand for formally trained therapists. These and other circumstances have combined to hinder the opening of

schools. It has been a vicious circle of no demand if there is no supply, and no supply if there is no demand.

Under these conditions, about the only places that could start training programs were institutions large enough to use their trainees in staffing the expanded service in their own departments. In short, the training schools sprang up as "in-service" or "on-the-job" programs because (1) the schools could usually charge no tuition, and could not afford to pay the learning student as much as they would an experienced employee; and (2) the average student could scarcely manage, even on no tuition, if he couldn't earn something to support himself while in school. This situation has forced schools to limit their enrollment sharply to the number their department staffs can accommodate, and therefore the few schools that have managed to survive are usually full.

Notwithstanding these difficulties, all of them have striven mightily to increase their offerings to more than mere in-service training. They have all incorporated lectures in their programs—some of them actually exceeding the requirements set forth in the "Essentials." One school has even affiliated with a two-year college

which gives an Associate in Arts degree to the graduate in addition to the certificate of proficiency in inhalation therapy issued by the hospital. Another university-affiliated school requires students to have two years of college before even applying.

Recently, there is an encouraging upswing in the trend employing *qualified* therapists, and while none of the schools maintains a placement service, they nearly all have many requests for their graduates. This, together with the emergence of the Registry already referred to (see editorial in February, 1960, *INHALATION THERAPY*), accounts for a marked increase in the demand for therapists with recognized schooling.

Early this spring, *INHALATION THERAPY* surveyed the schools known to us, to glean information for you. The main categories of information are summarized on the accompanying table. *Where there are blanks, information was not supplied by the school, or the situation is tailored to the individual, or subject to change.*

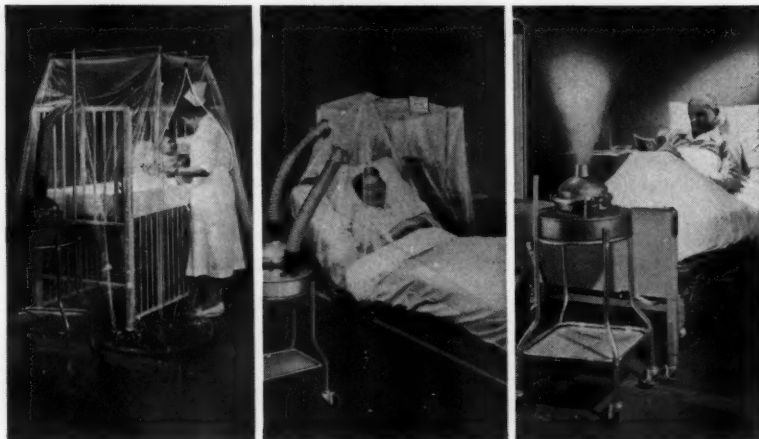
There are many individual differences in the schools, the chief important ones being (1) extent of compliance with the AMA-approved "Essentials," and (2) cost to the student. For more complete information, write the person indicated. And as we hear of more schools opening, we will tell you about them.

NAME	LENGTH OF COURSE AND ENTERING TIME	MAXIMUM ENROLLMENT	TUITION AND FEES	COMPENSATION	PERSON TO CONTACT
Hospital of the University of Pennsylvania	12 months January, July	4 persons	No tuition. Fee for uniforms	Monthly wage	John Julius Hospital of the U. of Penna. 3400 Spruce Avenue Philadelphia 4, Penna.
Mt. San Antonio College-Inter-Community Hospital	24 months* September	10 persons	No tuition. Expenses of about \$50 per semester		Mrs. Constance Cypert Inter-Community Hospital Covina, California
Medical College of South Carolina	12 months July	3 persons	No tuition; Cost of books	Monthly wage	John E. Mahaffey, M.D. Medical College Hospital 55 Doughty Street Charleston, South Carolina
U.C.L.A. Medical Center	24 Months** September	4 persons	No tuition; Lab coats must be furnished	Monthly wage	Walter L. Jones Senior Inhalation Therapist U.C.L.A. Medical Center Los Angeles 24, California
Royal Victoria Hospital	24 months when there is a vacancy	3 persons	No tuition	Monthly wage	Robert K. Merry Dept. of Inhalation Therapy Royal Victoria Hospital Montreal 2, Quebec, Can.
St. Joseph's Infirmary	12 months February 1962	4 persons	\$120 tuition plus texts		James C. McGaw Dept. of Inhalation Therapy St. Joseph's Infirmary Louisville 17, Kentucky
Edgewater Hospital	12 Months	3 persons	No tuition	Monthly wage	Edwin R. Levine, M.D. Edgewater Hospital 5700 North Ashland Ave. Chicago 23, Illinois

*Associate in Arts Degree Course

**Two years college is admission pre-requisite

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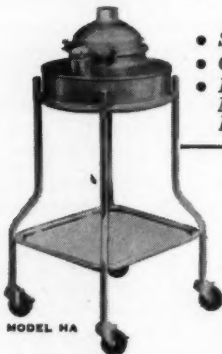
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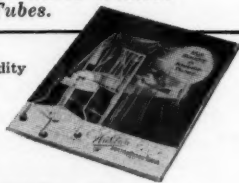
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— *Early Management of Myocardial Infarction*: B. E. Pollock; *Journal of the American Medical Association*, 161:404 (June) 1956.

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CHAPTER ACTIVITIES

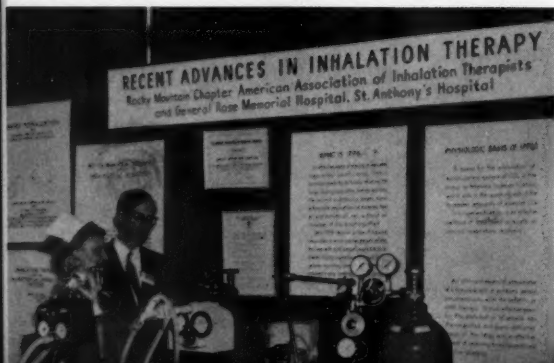
by Jack Sangster

AN EXHIBIT on "Recent Advances in Inhalation Therapy" was held by the Rocky Mountain Chapter with the General Rose Memorial Hospital and the St. Anthony Hospital, both of Denver, Colorado, at the Colorado Medical Society's Mid-Winter Clinics, held in Denver in February.

The display, which focussed on IPPB and heated aerosol therapy, featured the latest equipment for these modalities of treatment, together with large charts and tables of basic information. Many doctors took time to try both IPPB and aerosol equipment, and inquired about techniques of usage and after-care for office patient therapy.

New chapter officers include: Mrs. Vivian Curtis, St. Anthony Hospital, president; Mrs. Jeannette Stark, Beth Israel Hospital, vice president; Peter Blanco, General Rose Hospital, secretary Jack Hoogendoorn, Bethesda Hospital, treasurer; and James H. Harper, Presbyterian Hospital, assistant secretary-treasurer.

Mrs. Vivian R. Curtis, R.N. president of the Rocky Mountain Chapter and Roy Smith, M.D., Grand Junction, Colorado, in the exhibit sponsored by the chapter with the General Rose and St. Anthony's hospitals.



More than 60 therapists, representing hospitals from San Diego to Ventura attended the March educational meeting of the Southern California Chapter. It was the first meeting conducted by the newly elected officers (see cut).

David Schmidt, professional service representative of Winthrop Laboratories, showed the film "Post-operative Aerosol Therapy," and conducted a question and answer period.

Gene Finch, Bennett Respiration Products, demonstrated his company's IPPB machine, and lead a panel discussion, participated in by James Sands, M.D., Inter-Community Hospital, the chapter's medical advisor; Mr. Constance Cypert, Mr. Schmidt, and Mrs. Benton.



New officers of the Southern California Chapter, with their medical advisor, James Sands, M.D., are, left to right: Lenora Brenton, president; Lillian Van Buskirk, vice president; June Grieve, member of the board; and Marian Van Buskirk, secretary.

The Greater Boston Chapter at its February meeting was host to firemen and policemen from the Greater Boston area to hear Vincent Kracum, consultant for the Ohio Chemical & Surgical Equipment Company, speak on resuscitation.

Al McCullough of the O.E.M. Corporation spoke on "Clinical Uses of the Cofflator" at the March meeting of the Tennessee Inhalation Therapy Association.

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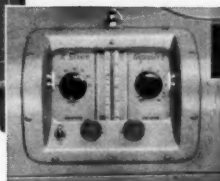
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From your

EXECUTIVE DIRECTOR

How Big Is Big Enough?

AS THE American Association of Inhalation Therapists grows in numbers, the process of communicating with you will become more difficult.

That's why, occasionally, you'll find a column written by me instead of by your editor.

In this issue I want to talk about the problems of increasing our membership.

The reason I am concerned about our numbers is that we need very much to increase in sheer numbers if we are to survive. It is that simple.

Now I know that my habit of blunt speaking at our meetings is not exactly popular. But I also know that running an association of this complex nature is not exactly a popularity contest. And I would like to say right here that I am more concerned with running this association efficiently than I am about the impression I make when I speak in realistic terms.

In my capacity as management and information counsel, I not only help run several other associations, but I meet many association executives. Like members of other crafts we usually talk shop and compare notes on costs, standards, membership campaigns, and other subjects of mutual interest.

Because of this background, and because I have been responsible for running the AAIT for the past six years, I know that this organization—if it is to be run efficiently and to operate in the black—must have a membership of at least 1,500 members. Of course, if we have more than that number, so much the better—but 1,500 is the minimum.

Presently we have a *potential* membership of about 900. I say potential because of that number, 172 have not paid their annual dues.

As you know, all unpaid members are removed from our membership list, and they must pay a \$3.00 reinstatement fee *plus* their dues if they wish to become members again.



Albert Carriere

So it appears that if we are to get along in a business-like fashion we need about 800 new members—and we need them mighty soon!

Where are these members coming from? And, if the interest in inhalation therapy is increasing daily, as we have so often heard, why aren't these new members forthcoming?

The answer to these questions are:

Our new members are coming from hospitals and service companies all over the United States and Canada; and technicians will not join an association that is not recognized by their local hospitals.

This means that we must do everything in our power to speed up the Registry. It also means that we have a tremendous educational job to do, namely, to make hospitals aware of the AAIT, its objectives and, particularly, its value to them. Again this is a slow process of communication, but one which we have started, and which we are to continue.

I believe that the AAIT is going to survive and that it is going to operate in the black.

But far more important, I also believe that we are slowly but surely gaining the respect of doctors, nurses and hospital administrators. I believe that they are more frequently looking to us for qualified therapists, for guidance on problems relating to inhalation therapy; and that they are beginning to look upon all members of the AAIT as honest-to-God professional paramedical specialists.

If each of you members will pitch in, and help develop interest in our association; if each one of you will try to get at least one new qualified member, I feel certain that 1960 will be a decisive year for this association.

Inhalation therapy is a new frontier, and you AAITers are the pioneers who must spread its gospel in the wilderness.

Will you do it?

continued from page 17

lar hyperventilation as is possible, and as complete and careful bronchial toilet as can be maintained. Those agents which will help both as direct and indirect bronchodilators should be used freely. Corticoids are almost always indicated. When no improvement is noted, it may be desirable to use a respirator to assist the patient's breathing. We have had the best success using the chest cuirass type rather than the "iron lung."

To evaluate the patient's condition and the effect of therapy, one must determine at intervals the blood pH as well as the total CO₂ content.

It must be emphasized that one cannot depend on the presence or absence of cyanosis, either for diagnosis of carbon dioxide narcosis or as a guide to therapy. Even when alveolar CO₂ is doubled and the patient is in severe acidosis, the blood may be fairly well saturated with oxygen. So great is the margin of safety where oxygen is concerned, that the blood will be fully saturated when alveolar oxygen tension is reduced to two-thirds of normal.

FUTURE AAIT CONVENTIONS

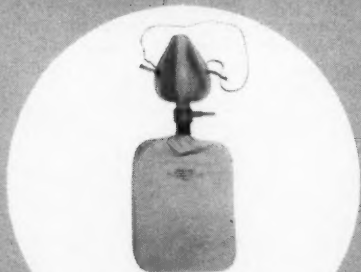
Convention cities for the next six years have been chosen by the AAIT Board of Directors. The headquarters office in Chicago now is working on dates for the meetings and the selection of suitable hotels. Current information:

YEAR	CITY	DATES	HOTEL
1960	Minneapolis	November 14-18	Pick-Nicollet
1961	Buffalo	November 6-10	to be chosen
1962	Chicago	to be chosen	to be chosen
1963	Greater Miami	to be chosen	to be chosen
1964	New York City	to be chosen	to be chosen
1965	Toronto	to be chosen	to be chosen

Usually, but not always, the AAIT meets the week in November that falls between election day week and Thanksgiving Day week. Ordinarily this is the third week in November.

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BOOK REVIEWS

by Howard R. Dockham

THE MANAGEMENT OF THE PATIENT WITH SEVERE BRONCHIAL ASTHMA, by Maurice S. Segal, M.D., Charles C. Thomas, Springfield, Illinois, 1950.

Dr. Segal first develops the clinical concept of bronchial asthma. He describes the origin of the pathology, tells what the asthmatic attack is like, what complications may occur, and remarks that there are comparatively few deaths during asthmatic attacks, despite their severity. An attempt is made to classify the types of asthma according to different causative agents or other factors, but he points out the inconsistencies of the various classifications, and the impossibility of fitting all asthmatics into one category or another.

From this he proceeds to an analysis of the allergic concept of bronchial asthma, together with suggestions for its management. He makes the point, however, that "allergically directed therapy should not be regarded as the specific therapy for the management of bronchial asthma." Resolution of the emotional factors which may precipitate or modify the attack is just as important.

There follows an interesting section on research done to find substances which will protect a subject from the bronchospasm induced deliberately under controlled conditions.

There are several chapters devoted to drugs used in treating asthma—sedatives, antihistaminics, digitalis, diuretics, bronchodilators, epinephrine, etc., and a separate chapter on the therapeutic use of gases. Here he discusses oxygen, helium-oxygen, and $\text{CO}_2\text{-O}_2$ or $\text{CO}_2\text{-O}_2\text{-He}$ mixtures as well as aerosols.

There is a chapter on positive pressure therapy which details the continuous positive pressure hood devised by Barach, and the expiratory positive pressure mask also introduced by Barach. (It must be remembered this monograph was published in 1950, before IPPB had come into clinical use to any appreciable extent; hence the absence of reference to IPPB.)

The book closes with three chapters on bronchial evacuation, management of infections, and miscellaneous procedures like psychotherapy, going to Arizona, artificial fever therapy, etc. The evacuation chapter discusses expectorants, postural drainage and bronchoscopic procedures.

CLINICAL PHYSIOLOGY OF THE LUNGS, by Cecil K. Drinker, M.D., D.Sc., Charles C. Thomas, Springfield, Illinois, 1954.

Dr. Drinker wrote this monograph "to give impetus to thinking," and well he does. My overall impression is that the lungs form an *independent* reactive unit, operating on principles the lungs in general does not recognize. In the doc-

tor's words, "... the integration of the blood flow through the lungs with the needs of the body is achieved by the structure of the lungs themselves, not by any complexity of central regulation."

The muscle and lymphatic systems of the lungs evidently behave in a similarly autonomous fashion; for the author gives reasons for his thesis that the lungs do not react as do other systemic organs: e.g., the absence of afferent nerves within the lung tissue and the alveoli.

Dr. Drinker presents a clear, precise picture of the anatomy and physiology of the lungs which anyone can follow if he reads closely. From this basis, he branches into his discussion of pulmonary circulation and its unique characteristics that differentiate it from the *systemic* bronchial vessels, which dilate and constrict by central nervous regulation.

An interesting note: pulmonary edema, bugaboo of chest diseases, arises—among other things—from increased pulmonary capillary permeability. The permeability is, in turn, regulated in part by the central nervous system. From this arises the possibility that some pulmonary disorders may find their etiology in abnormalities of structure or function of systemic vessels in the lungs, rather than pulmonary ones.

TREATMENT OF RESPIRATORY EMERGENCIES INCLUDING BULBAR POLIOMYELITIS, by Thomas C. Galloway, M.D., Charles C. Thomas, Springfield, Illinois, 1953.

It is Dr. Galloway's contention that the obstructive respiratory problems in many diseases are overlaid by the symptoms of these diseases, so that the physician fails to treat anoxia until irreversible damage has occurred.

After outlining the causes of respiratory obstructions and their symptoms, the author presents a good picture of bulbar polio and its treatment, giving primacy to maintaining a patent airway.

What interested me was Dr. Galloway's mention of postural drainage, which seems an obvious treatment in any respiratory disease where copious, tenacious secretions accumulate. No doubt there is fear of cerebral edema if postural drainage is carried out for too long a period. Even a slight Trendelenburg position would assist in removing secretions; for "... it helps to insure that the lower airway is not flooded ... (and) ... that areas of atelectasis with or without pneumonitis do not develop."

The use of tracheotomy should be preventive when respiratory distress is evident, and not used as a last resort when irreversible damage (as pulmonary edema and cerebral anoxia) is already manifest, as the author points out.

Dr. Galloway has presented factors we no doubt know concerning respiratory obstruction, but his paper serves as a warning that such symptoms must be heeded quickly or the patient may succumb to anoxia and not the disease for which he is being treated.

continued from page 19

too much condensation on the sides of the tubing, and not enough fog reaching the patient.

I am often asked what therapeutic value there is to generating an aerosol into an ordinary oxygen tent while it is running. With the standard oxygen tent, there is *none!* Except with tents especially designed for such use and incorporating their own aerosol generators, the aerosols from auxiliary nebulizers are nearly all condensed out on the cooling coils, so that it is necessary to turn off the air conditioning of the plain oxygen tent to prevent this removal of aerosol if any therapeutic results are to be gotten at all. If it is uncomfortable for the patient to do without the air conditioning, then I suggest that it be left on, and the aerosol be administered by a mask, leaving the patient right in the tent, and using a separate source of oxygen for the aerosol face mask.

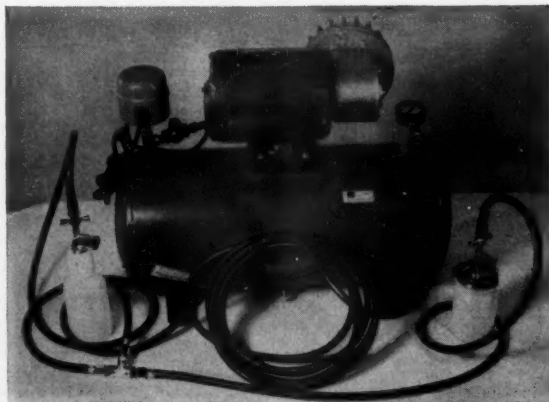
Another question is: in IPPB treatments, what is the relative humidity reaching the patient when only a few cc of water are being nebulized into the

stream of dry gas from a tank? The answer is pretty close to zero. It's far below the humidity of the external ambient air, because if the mask is tight-fitting, there is no way for humidity to get in from the outside air. The amount of water needed to saturate the amount of air inspired in the course of a 10 minute treatment would be a couple of hundred cc, not just 3 to 6 cc; so *the upper respiratory passages are clearly dried by this form of therapy.*

When using plain water, it evaporates (even inside the flex tube of the IPPB) before it reaches the patient—before it reaches his throat, much less his respiratory passages. Within two or three inches of the nebulizer that water has become gas. It's not droplets any more, and so what is happening is that the patient is receiving oxygen with 3 to 5% R.H., and no aerosol whatsoever, when you use plain water. If a solution stabilized with glycerine or some other such agent is used, then some is deposited on the bronchial mucosa, but not nearly enough to overcome the drying effect of removing water from the mucus lining.

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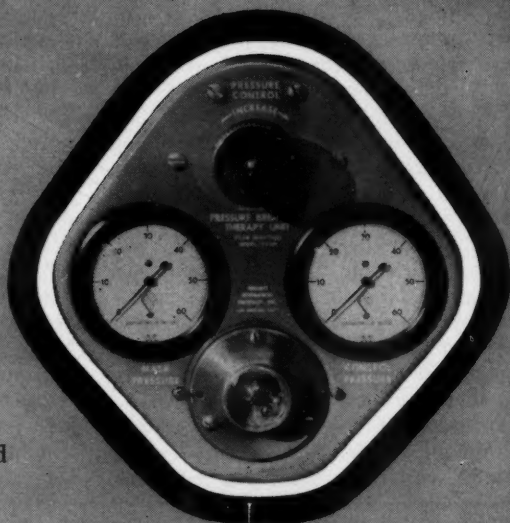
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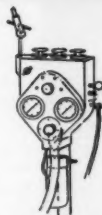
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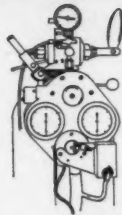
Adaptations of this famous basic unit are illustrated below. We invite you to write for literature and reprints or demonstration.



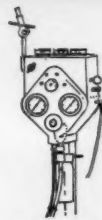
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